ILLUSTRATION 5-4

Information Collection for Structural Analysis

Structural Integrity of the Tank

1. Production drawings of the tank including all dimensions and date of manufacture. This includes but is not limited to:

   - Length of tank (without shell)
   - Dimensions of the shell (for an ellipse height and length).
   - Thickness of the shell and head.
   - Dimensions of head (depth, radius, and knuckle radius).
   - Location and dimensions of any baffles or bulkheads.
   - Location of all welds and the weld process, type of weld, welding material, and joint efficiency.
   - Location of internal valves and weld process.
   - Distance from 5th wheel pivot point to middle of tank (or end of kingpin to middle of tank if tractor is unavailable).
   - Location of all tank supports (frames, wheels, suspensions, king pin).
   - Location of all appurtenances and pads for attaching appurtenances.
   - Locations and information on any linings, insulation, hose tubes, cabinets and piping.
   - Height from ground to center of the tank (preferably when full).

2. Material specifications for all tank materials. This includes mill test reports, tensile pull results, copies of the specs for ASTM references as well as industry references i.e. U.S. Steel Handbook. I need hard copies of any references they are using.

3. Any and all design calculations that may be available. If no calculations or drawings are available, ask the management to have them done.

4. Tank capacity in gallons as well as capacity of individual compartments if applicable.

5. Maximum product density.

6. Maximum design weight of lading.

7. Gross vehicle weight rating.

8. Weight of undercarriage.

9. Weight of tank and appurtenances.

10. All information from the spec plate and the name plate.

11. Pictures of the tank.

Overturn Protection Devices.

12. Production drawings of overturn protection devices including all dimensions and methods of attachment to the tank. This includes but is not limited to:

    - Location of devices on tanks.
    - Dimensions of the devices themselves including thickness.
    - Location, thickness, and dimensions of any pads for attachment to the tank.
    - Types of welds, welding process, welding materials, and joint efficiencies.
    - Location, dimensions, and method of attachment of any extra bracing such as end dams or gusset plates.

13. Material specifications for all materials used to manufacture overturn protection devices and attach them to the tank. Same rules as above about obtaining hard copies of any sources they are using for this information.

14. Any design calculations to verify that the overturn protection devices satisfy the criteria. If no calculations are available, ask the management to have them done.

15. Pictures of the over-turn device.

Rear-end Protection Devices

16. Production drawings of the rear-end protection device, including all relevant dimensions and methods of attachment to the cargo tank motor vehicle. This includes but is not limited to:

    - Dimensions of the device itself
    - Location and Types of welds, welding process, welding materials, and joint efficiencies of any and all welded joints.
    - Size and materials specifications of any plates, bolts, or other fastening device used for attachment to the tank.

17. Materials specifications for all materials used to manufacture the rear-end protection device and attach it to the vehicle. This must include welding and bolting materials were applicable. Again hard copies of any references used are necessary.

18. Design calculations or test results to verify that the rear-end protection device satisfies the requirements if they are available. If such calculations are not available, ask the management to have them done.

19. Pictures of the rear-end protection device and its attachment to the vehicle.

Bottom Damage Protection

20. Production drawings of bottom damage protection devices including all relevant dimensions and methods of attachment to the tank. If the bottom damage protection consists of a safety cage see numbers 12 and 16. If the bottom damage protection consists of a shear section please provide:

    - Inner and outer diameter of the nominal piping.
    - Inner and outer diameter of the pipe at the shear section.
    - Specifications on the piping material.

21. Material specifications for all materials used to manufacture bottom damage protection devices ant attach them to the tank. Again hard copies of any reference materials are necessary.

22. Design calculations if available. If calculations are not available ask management to have them done.

23. Pictures of the bottom damage protection.